

Potable water distribution

blutop

DN/OD	Dint
75	68
90	83
110	103
125	118
140	132
160	152



Comprehensive pipe solutions

PAM
SAINT-GOBAIN

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Innovating for you

BENEFITS OF blutop



SUSTAINABLE DEVELOPMENT

The BLUTOP® solution was developed in keeping with the principles of sustainable development and delivers outstanding environmental performance.



EXTENDED SERVICE LIFE

As investment in renewing water supply infrastructure is declining in relative terms, water network managers are demanding longer service lives. Ductile iron components are not prone to ageing. Their mechanical properties remain constant over time.



LEAKTIGHTNESS

Reducing the amount of water lost in leaks from pipe systems is a major issue. BLUTOP® delivers a two-pronged solution, as ductile iron components (including pipes, fittings, valves and accessories) have an excellent reputation for both leaktightness and pressure resistance.



LESS ENERGY REQUIRED FOR PUMPING

Improving leaktightness reduces head losses, which in turn saves energy.



INSTALLATION

BLUTOP® revolutionises pipe installation and use. Pipe-laying operations are quicker because pipes and fittings can be transported by hand and inserted using a crowbar.



OPERATION

The BLUTOP® pipe range is compatible with existing plastic pipe networks and their related connection and maintenance accessories.



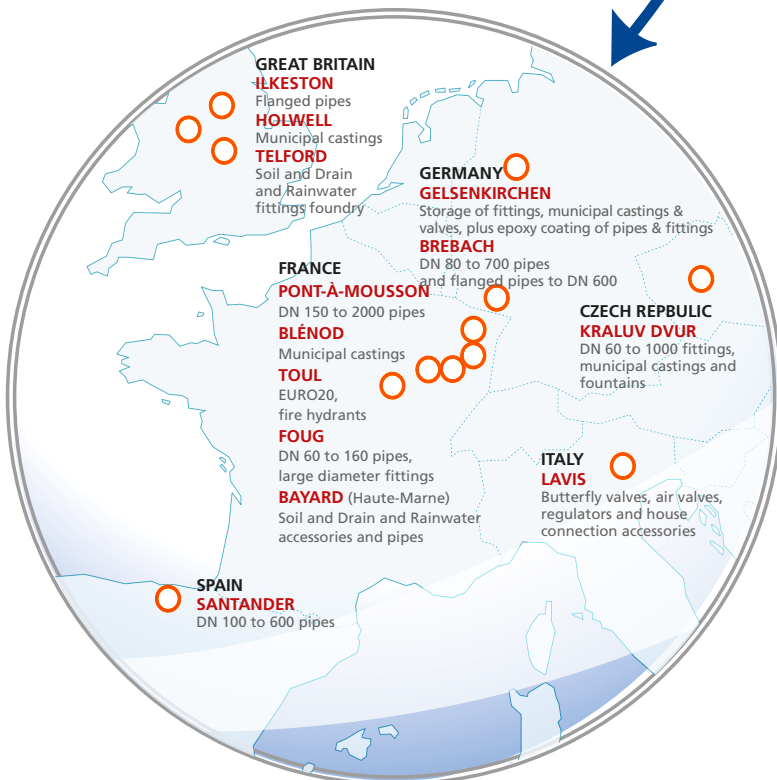
WATER QUALITY

In accordance with the major European regulatory requirements, drinking water Certificates have been obtained for all materials used in the BLUTOP® range (DUCTAN® coating, epoxy, elastomers, lubricating paste and repair products).

***Durability
Made in Europe***



PRODUCTION "MADE IN EUROPE"



Saint-Gobain PAM in Europe:

- factories in France, Germany, United Kingdom, Spain, Italy and Czech Republic
- 4,500 employees
- 1 research centre
- 1,500 patents

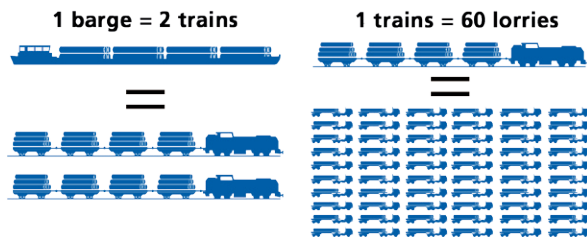
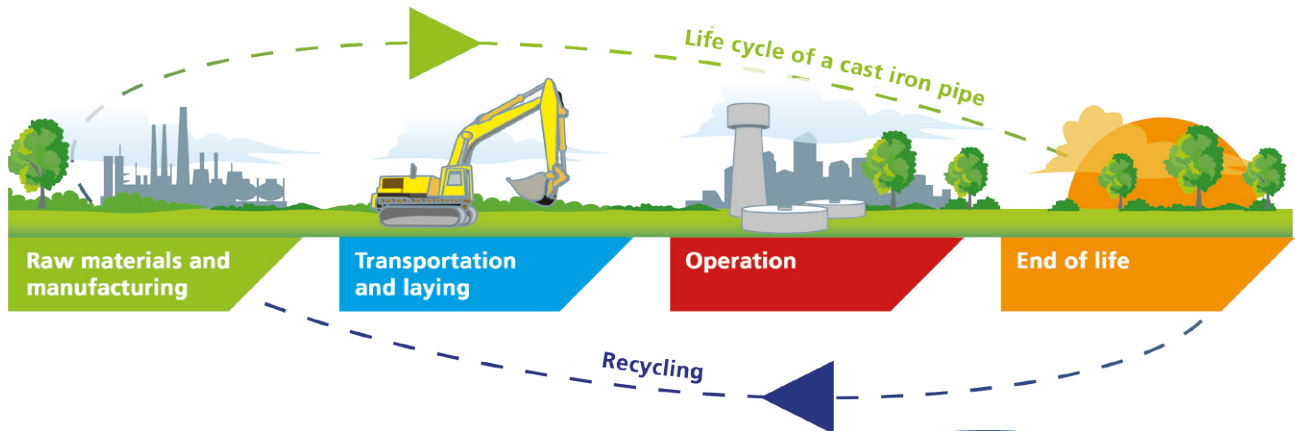


BLUTOP®
 A EUROPEAN
 TECHNOLOGICAL
 BREAKTHROUGH!

BLUTOP® awards:

- 8 patents
- Société Industrielle de L'Est award
- Saint-Gobain Arches for Innovation award
- Innovation Award presented by Brazil's largest water company, SABESP

Sustainable development



We all need to take responsibility for the environment

65% of raw materials used in the production process are carried by river, rail and/or sea.

Commitment

Innovation

Responsibility



A RANGE DESIGNED TO LAST MORE THAN 100 YEARS

TARGET - 100 YEARS!

The replacement rate for water networks is less than 1% per year (around 0.6% in France). We expect that pipelines laid today will last more than 100 years, which is longer than the periods adopted in conventional depreciation calculations and longer than the service life specified in the applicable standards.

To achieve this durability target, BLUTOP® features:

- High mechanical strength
- Protection against soil aggression
- Protection against water aggression
- Flexible junctions



***BLUTOP where I live:
An economically and
environmentally sound choice!***

**Designed and
manufactured
in Europe**

**Forward thinking
asset management**

**Sustainable
development**



Ductile iron

► HIGH MECHANICAL STRENGTH

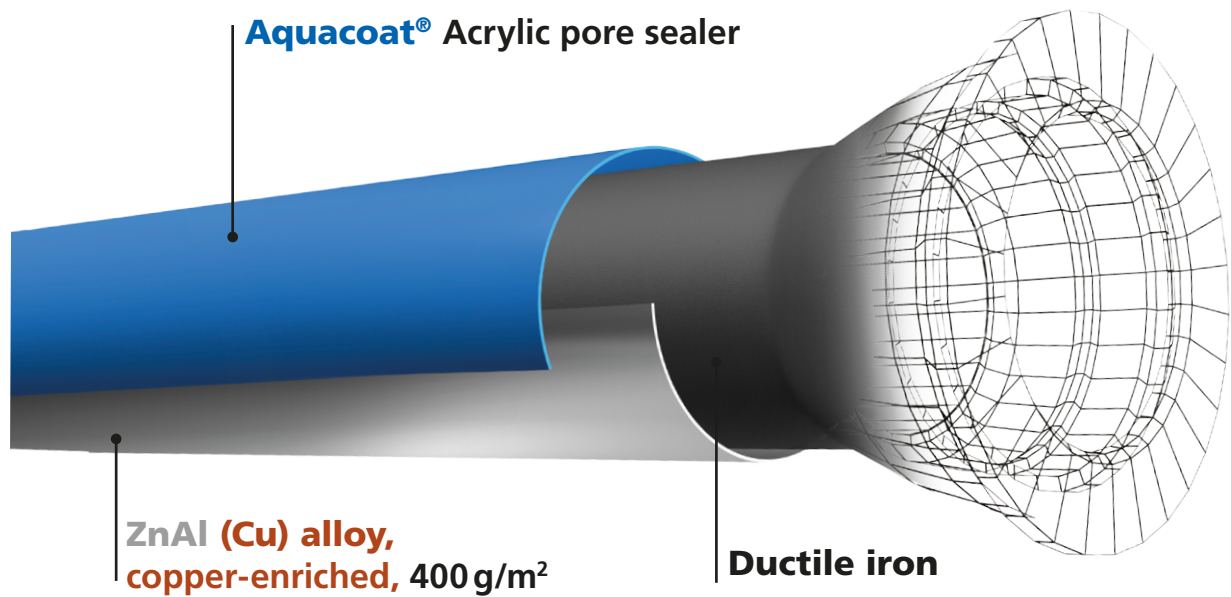
BLUTOP® pipes are marketed as pressure class C25 (25 bar) products. Burst tests conducted on DN/OD 110 products yielded actual failure values in excess of 150 bar. Each pipe is subjected to a factory pressure test at 40 bar followed by a gas-tightness test after the interior coating has been applied.

DN/OD	75	90	110	125	140	160
Diametrical rigidity	656 kN/m ²	373 kN/m ²	201 kN/m ²	136 kN/m ²	113 kN/m ²	103 kN/m ²

As the table above shows, BLUTOP® pipes have excellent diametrical rigidity, which helps to prevent ovalisation when buried.

BioZinalium®

► PROTECTION AGAINST SOIL CORROSION



The BioZinalium® coating consists of two layers:

- **A layer of zinc-aluminium 85/15 alloy, enriched with copper, with a minimum surface density of 400g/m²,** applied by spraying molten metal onto the surface of the iron, using an electric arc spray gun, from ZnAl (Cu) alloy wire.
- **A protective layer of Aquacoat® (semi-permeable),** a water-based blue acrylic of average thickness 80 microns applied using a spray gun.

Ductan®

► RESISTANCE TO WATER AGGRESSION

Water can attack pipes, either as a result of its mineral composition or because it contains disinfectants or other chemical treatments. Saint-Gobain PAM has opted to apply an ultramarine blue DUCTAN® thermoplastic interior coating rather than the cement lining traditionally used with cast iron pipes.

- Key features:
- Outstanding adhesion, with a mean tear strength of 15 MPa (150 kg/cm²) and a minimum of 8 MPa (an important value for tapping under load and on-site cutting).
 - Perfectly smooth for optimum flow
 - Full and uninterrupted protection for the pipe shell, bell and spigot
 - The lightweight but extremely tough DUCTAN® coating enables the weight of BLUTOP® pipes to be reduced by 25%.

LEAKTIGHTNESS

GUARANTEED LEAKTIGHTNESS

Water authorities all around the world have to keep in mind the reduction of leakage rates and the respect of a defined budget frame work. These concerns have a direct influence on maintenance, renewal and extension programmes for water networks, as well as encouraging the choice of reliable and durable pipes.

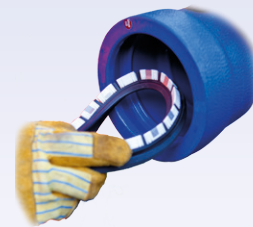
Blutop® is Saint-Gobain PAM's practical response to the genuine concerns of investors, managers and operators in charge of water distribution networks.

Blutop joint performance makes easier the installation of the pipeline and contributes to a reliable operation of the network (normal service pressure and transient surge pressure conditions).

CHANNELLING THE JOINTING FORCE

The Blutop joint has been specially designed in order to guarantee:

- Easy laying with a lower force requirement to allow for jointing using a crowbar
- Safe laying thanks to a mechanism to prevent the gasket from becoming loose during assembly
- Support points along the fittings make for easy jointing along the correct axis plane



BLUTOP® joints, a high performance technology

Leaktightness

Reliability

PFA: 25 bar

Joint reliability

CONTROLLED INSERTION FORCE



The BLUTOP® joint features a unique, optimised design and was developed in close cooperation with pipe laying teams:

- The insertion force is adjusted by hand using just a crowbar, making pipe-laying much easier.
- Designed for reliable installation with a device to prevent the joint gasket from being ejected during assembly.
- Fittings feature load bearing points enabling them to be easily pushed into position when aligned with the pipe.

PRESSURE TESTS PERFORMED IN EXTREME CONDITIONS

Buried pipe runs are subject to multiple pressure variations (due to day/night cycles, water hammer effects, pressure exerted by the water table, etc.).

BLUTOP® joints have been rigorously tested in accordance with the criteria defined in the EN545 standard, in extreme angular deviation and dimensional tolerance conditions. In particular, joint performance was tested in the following circumstances:

- Transient surge in operating pressure (at least 1.5 times the maximum allowable working pressure of the joint),
- Vacuum due to draining or cavitation
- Pressure pulses near pumps (24,000 cycles)
- External pressure exerted by a water table

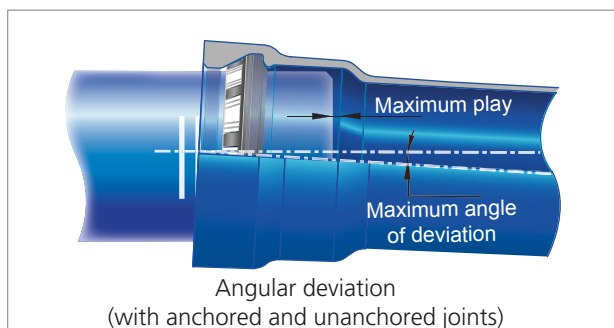
Saint-Gobain PAM developed these tests with the aid of state-of-the-art finite-elements computer modelling techniques.

A FLEXIBLE JOINT WHICH ADAPTS TO GROUND MOVEMENTS

Both the anchored and unanchored versions of BLUTOP® joints are designed to withstand a particularly high angular deviation of 6°.

The enhanced jointing depth also decreases the risk of pipe dislocation.

As a result, BLUTOP® offers excellent performance in soil subject to ground movements.



INCREASED EFFICIENCY



MANUAL INSTALLATION

Easier pipe-laying conditions are a key benefit with the BLUTOP® range: transport to hard-to-reach locations; lowering into trenches; assembly in confined spaces, etc.

BLUTOP® has proved its effectiveness in the field, significantly improving the operating efficiency and working conditions of pipe-laying teams.

***BLUTOP® enables
a fast and efficient
installation***

**Assisted
pipe-laying**

Safe

**Quick to
install**

Efficient



IMPORTANT BENEFITS !

TRANSPORTABLE BY HAND

BLUTOP® pipes can be carried by two people without the need for mechanical handling equipment. Pipes can be brought right to the edge of the trench, even in hard-to-reach locations. They can be lowered into the trench without using mechanical lifting equipment. Pipe fittings have ergonomically-designed handles for easy handling.



PIPES INSERTED USING A CROWBAR

Pipes and fittings can be inserted using just a crowbar. This achievement is attributable to:

- The design of the BLUTOP® junction, which has been optimised to reduce the required insertion force.
- The shape of the fittings, which feature load-bearing points against which the crowbar can be positioned in order to apply force in exactly the right direction, along the insertion plane.



FASTER PROGRESS AT WORKSITES

BENEFITS

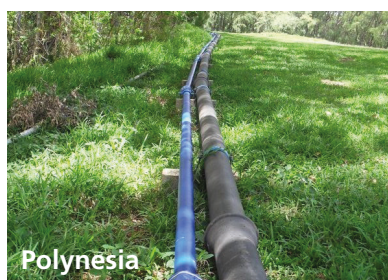
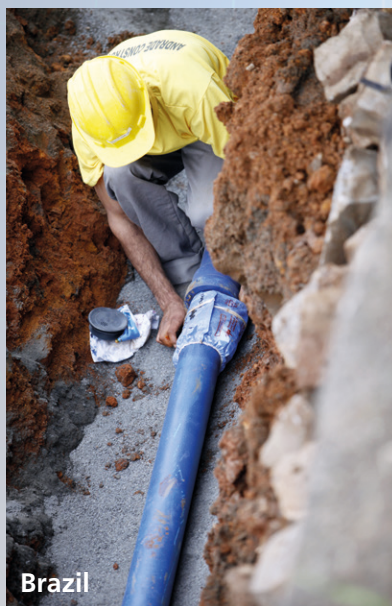
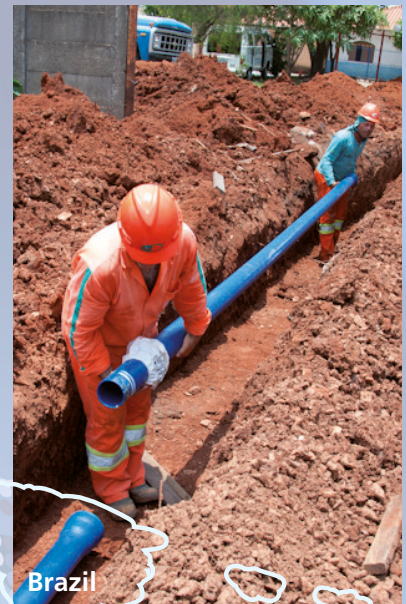
- **Easily-cleaned socket.** The flowing lines of the socket enable it to be easily cleaned if contaminated by earth from the trench.
- **Easily-fitted joint.** The pre-lubricated joint fits easily into the socket without causing deformation.
- **Quick to cut.** The thinner iron wall and the use of a DUCTAN® coating rather than a cement lining help to decrease cutting times and disk wear.

- **Easy hole cutting.** BLUTOP® hole-cutting tools cut the DUCTAN® coating cleanly and systematically recover the cut core.

- **Fewer fittings.** The exceptional angular deviation (up to 6°) at joints means that fewer fittings are required, thereby reducing the cost of works.

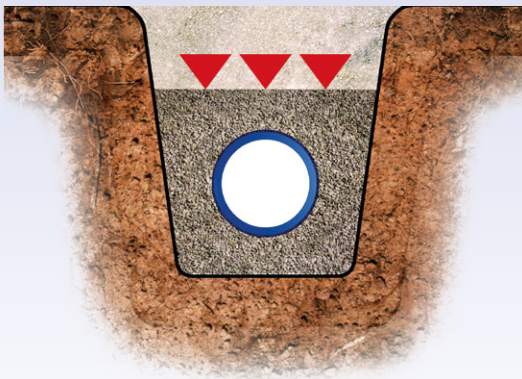
For more information, please refer to the "installation advice" guide.

A SHARED SUCCESS ACROSS 17 COUNTRIES



THE ECO-INSTALLATION ADVANTAGE OF BLUTOP®

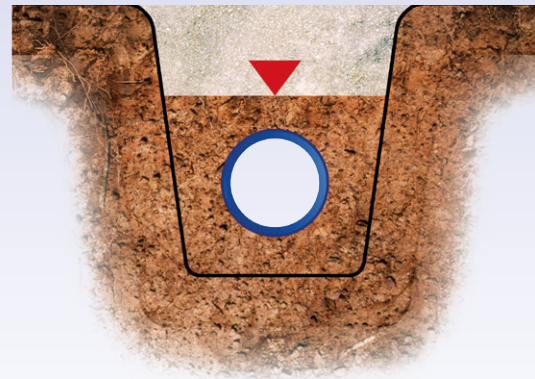
Traditional installation with brought-in backfill



95 % compression (SPO*)

* SPO : Standard Proctor Optimum

Eco- installation using original backfill



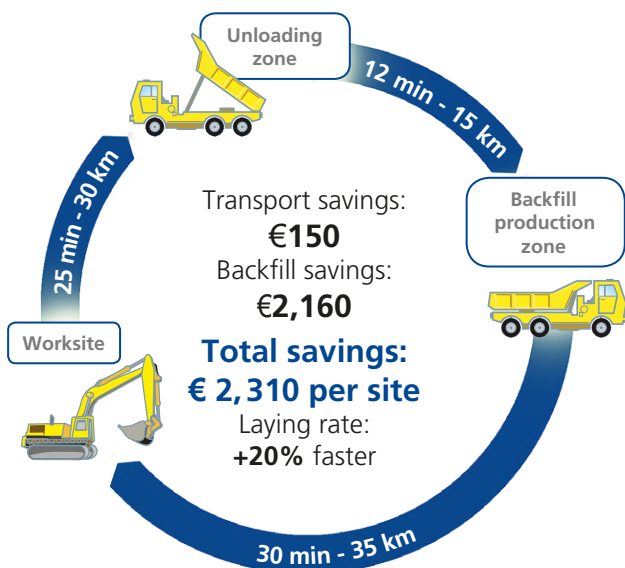
85 % compression (SPO*)



500 m of pipes laid using the ECOPOSE technique saves 1 tonne of carbon emissions!

ECOPOSE SAVINGS

- Cover = **less filler material required**
- Fewer truck journeys = **lower carbon emissions**
- Ductile iron = **endlessly recyclable**
- Anchoring = no concrete stops = **lower carbon emissions**



TESTIMONIAL

In Valleroy-aux-Saules, DN 110, PFA 25 bar :

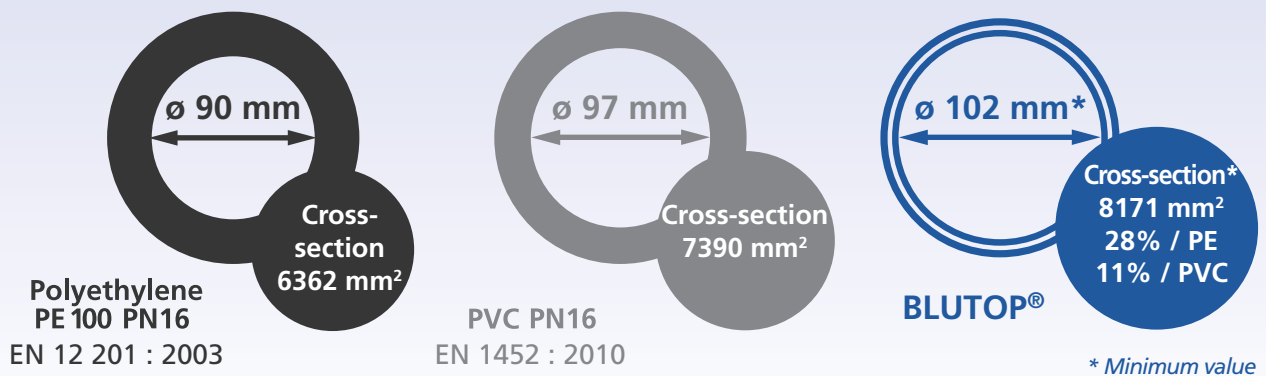
«Also, everyone involved in this project agreed that using natural backfill offers significant gains by eliminating the need to bring in additional materials. »

OPERATION-ORIENTED DESIGN

The BLUTOP® range has been designed with careful consideration for water network operators' requirements. The range's dimensional compatibility with PE or PVC plastic pipes is a

major advantage when extending the existing network or replacing old or prematurely aged pipe sections.

Example : DN/OD 110



A range designed to facilitate the extension or renewal of my water network

Reliability
Lower operating costs
Compatibility



Hydraulic diameters of PVC, HDPE and BLUTOP® pipes

	PVC	Polyethylene		BLUTOP®
PN/PFA	16	PE 80 16	PE 100 16	25
DN/OD 75	64	58	61	68
DN/OD 90	77	70	74	83
DN/OD 110	97	85	90	103
DN/OD 125	110	97	102	118
DN/OD 140	123	109	115	132
DN/OD 160	141	124	131	152

PVC pipe as per EN 1452 and PE pipe as per EN 12201

LOWER PUMPING COSTS

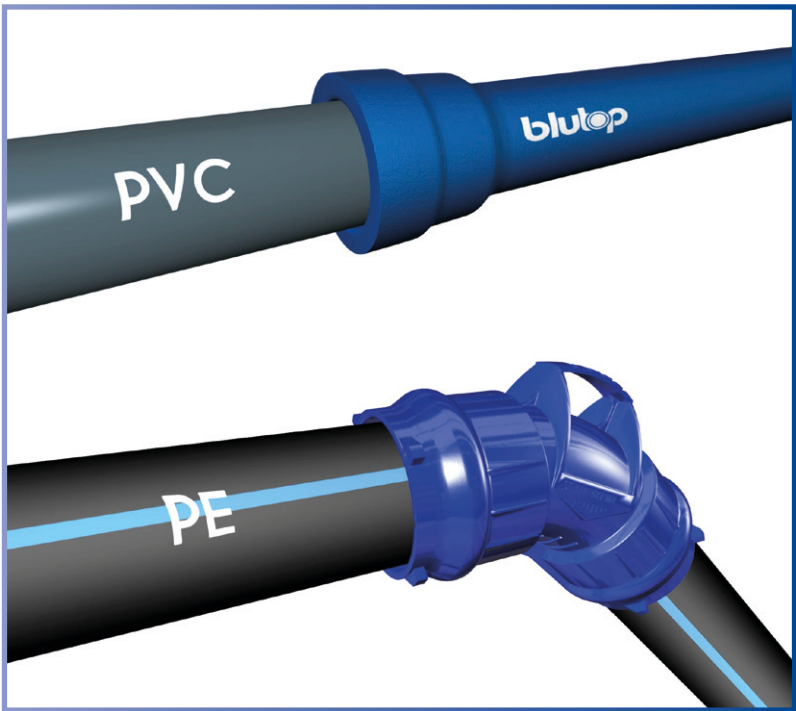
Head losses are reduced by a combination of a large hydraulic cross-section and the perfectly smooth DUCTAN® lining.

These characteristics help to cut pumping costs, and in some cases, enable sufficient water flow rates for fire protection purposes in remote locations (60 m³/h as specified in the French ministerial memo of 10/12/1951)

FULLY COMPATIBLE WITH PLASTIC PIPES

BLUTOP® pipes and fittings are designed to be compatible with plastic pipes and accessories.

PVC or HDPE pipe spigots that comply with applicable standards can be inserted into BLUTOP® pipes and fittings.



SUSTAINABLE AND RELIABLE

SUSTAINABLE DEVELOPMENT COMMITMENT

The finishing coat (pore sealer) of BioZinalium® is produced using an emulsion of water-based acrylic-PVDC resin, which contains neither organic solvents nor Bisphenol A (BPA).

It contributes to :

- reducing emissions of volatile organic compounds (VOCs) into the atmosphere,
- complying with sanitary recommendations for reducing the risk of exposure for the population and the environment to BPA.

As an illustration, the move to acrylic paint in 2012 helped to reduce VOC emissions by 24 % in our Saint-Gobain PAM plants.



Water quality

CAREFULLY SELECTED MATERIALS

All materials used in BLUTOP® components that come into contact with water have drinking water certificates. They comply with European regulations, and are fully suitable for the distribution of potable water.

EUROPEAN APPROVAL

The BLUTOP® range is designed for use throughout Europe. It has already been approved at national level as follows:

- Certificate of conformity with the Belgian "Hydrocheck" approval procedure issued by Belgaqua
- Certificate of conformity with the German UBA-Guideline and DVGW-W270 approval procedures issued by the Hygiene-Institut des Ruhrgebiets in Gelsenkirchen

Certificate of conformity with the BS 6920 standard issued by WRAS in the United Kingdom

- Certificate of conformity with "DWI Regulation 31 (4)(a)" in England, Wales and Scotland, issued by DWI on the basis of a report by WRC.

INERT IN CONTACT WITH WATER

DUCTAN® is an extremely pure lining material. It successfully passed all tests relating to the migration of organic compounds into water.

AN ECOLOGICAL AND SAFE CHOICE

Thanks to its AQUACOAT® painting, BioZinalium® not only has a low environmental impact, but also is a solution to public health concerns.

The environment and water quality are important to our family

Quality
Trust





Handle

BLUTOP® anchored
joint with deviation
up to 6°

Bend fitting

250 µm-thick
fusion bonded epoxy
exterior coating

A complete solution

BioZinalium®

Exterior coating :
Blue Aquacoat® pore sealer
Zn/Al(Cu) alloy at 400g/m²

Ductile iron

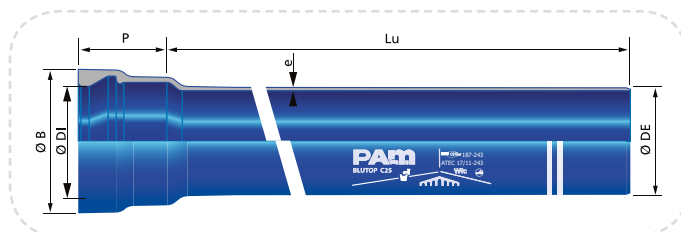
BLUTOP® unanchored joint
with deviation up to 6°

300 µm-thick DUCTAN®
thermoplastic lining

- High hydraulic cross-section
- Outside diameter compatible
with PVC and PE pipes

100% compatible with plastic pipes

PIPES

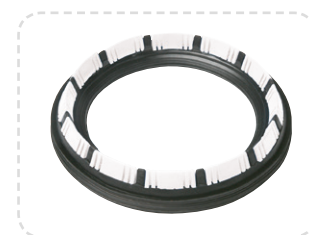


Pipe

DN/OD mm	Lu m	Class bar	nominal th.mm	DE mm	DI mm	P mm	B mm	Weight kg/m	Reference
75	6	25	3.0	75.0	77.7	82.0	113.0	5.10	KXL75H60AQ
90				90.0	92.7	84.0	130.2	6.20	KXL90H60AQ
110				110.0	112.8	87.0	149.5	7.60	KXM11H60AQ
125			3.1	125.0	128.0	92.0	164.0	8.90	KXM12H60AQ
140				140.0	143.1	94.4	183.0	10.00	KXM14H60AQ
160				160.0	163.3	97.5	202.0	11.80	KXM16H60AQ

Standard BLUTOP® Gasket

DN/OD mm	PFA bar	Weight kg	Reference
75	25	0.060	JXL75BA
90		0.068	JXL90BA
110		0.082	JXM11BA
125		0.108	JXM12BA
140		0.130	JXM14BA
160		0.170	JXM16BA



Anchored BLUTOP® Gasket

DN/OD mm	PFA bar	Weight kg	Reference
75	16	0.068	JXL75CA
90		0.077	JXL90CA
110		0.093	JXM11CA
125		0.118	JXM12CA
140		0.168	JXM14CA
160		0.221	JXM16CA



Anchored IZIFIT® Gasket

DN/OD mm	Weight kg	Reference
75	0.109	JIL75CA
90	0.125	JIL90CA
110	0.146	JIM11CA
125	0.189	JIM12CA



Locking extension piece

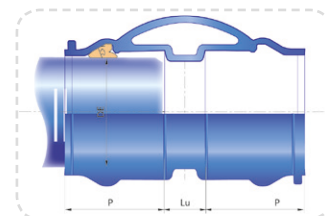
DN/OD	Weight kg	Reference
140	2.800	JZM14VX
160	3.100	JZM16VX



FITTINGS

Non-sliding collar

DN/OD mm	ØOD mm	P mm	Lu mm	Weight kg	Reference
90	90	92.5	40	4.00	KXL90MN
110	110	99.0		4.90	KXM11MN
125	125	104.0		5.50	KXM12MN



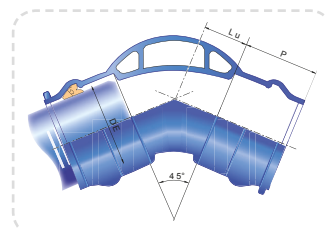
Semi-sliding collar with bulge for hole-cutting

DN/OD mm	ØOD mm	P mm	L mm	Weight kg	Reference
75	75	87.0	254	5.30	KXL75MM
90	90	92.5	265	6.30	KXL90MM
110	110	99.0	275	7.30	KXM11MM
125	125	104.0	295	8.80	KXM12MM
140	140	108.0	305	9.00	KXM14MM
160	160	114.0	315	10.70	KXM16MM



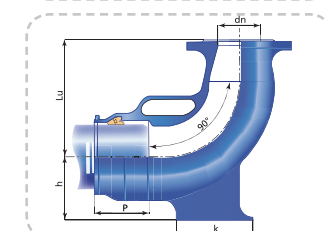
Bend

Angle (degrees)	DN/OD mm	ØOD mm	P mm	Lu m	Weight kg	Reference
90° 1/4	75	75	87.0	70.0	4.40	KXL75CA
	90	90	92.5	75.0	5.50	KXL90CA
	110	110	99.0	85.0	7.10	KXM11CA
	125	125	104.0	110.0	8.80	KXM12CA
	140	140	108.0	110.0	9.50	KXM14CA
	160	160	114.0	130.0	12.30	KXM16CA
45° 1/8	75	75	87.0	45.0	4.20	KXL75CB
	90	90	92.5	50.0	5.10	KXL90CB
	110	110	99.0	60.0	6.20	KXM11CB
	125	125	104.0	65.0	7.00	KXM12CB
	140	140	108.0	70.0	8.65	KXM14CB
	160	160	114.0	70.0	10.30	KXM16CB
22°30' 1/16	75	75	87.0	25.0	3.40	KXL75CD
	90	90	92.5	30.0	4.40	KXL90CD
	110	110	99.0	30.0	5.50	KXM11CD
	125	125	104.0	30.0	6.60	KXM12CD
	140	140	108.0	35.0	6.97	KXM14CD
	160	160	114.0	35.0	9.20	KXM16CD
11°15' 1/32	75	75	87.0	25.0	3.50	KXL75CE
	90	90	92.5	25.0	3.80	KXL90CE
	110	110	99.0	30.0	5.80	KXM11CE
	125	125	104.0	30.0	6.70	KXM12CE
	140	140	108.0	30.0	7.00	KXM14CE
	160	160	114.0	35.0	9.10	KXM16CE



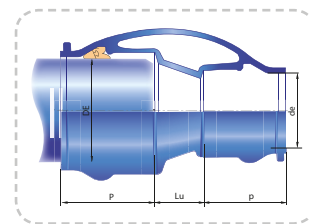
Duckfoot bend

Angle (degree)	DN/OD mm	ØOD mm	dn mm	P mm	Lu m	h mm	k mm	Weight kg	Reference
90° 1/4	75	75	80	87.0	165	110	107	8.30	KXL75DF0E
	90	90	80	92.5	165	110	107	8.00	KXL90DF0E
	110	110	80	99.0	180	125	126	11.40	KXM11DF0E
	125	125	80	104.0	220	120	146	13.60	KXM12DF0E
	140	140	80	108.0	220	—	146	14.00	KXM14DF0E
	160	160	80	114.0	220	150	146	16.20	KXM16DF0E
	160	160	100	114.0	220	150	146	16.40	KXM16DF0F



Taper

DN/OD mm	ØOD mm	Øod mm	P mm	p mm	Lu mm	Weight kg	Reference
90	90	75	92.5	87.0	40.0	3.70	KXL90VE0C
110	110	75	99.0	87.0	50.0	4.60	KXM11VE0C
	110	90		92.5	50.5	5.00	KXM11VE0D
125	125	75	104.0	87.0	55.0	5.10	KXM12VE0C
	125	90		92.5	50.0	5.20	KXM12VE0D
	125	110		99.0	45.0	5.50	KXM12VE0E
140	140	90	108.0	92.5	50.0	5.51	KXM14VE0D
	140	110		99.0	45.0	5.91	KXM14VE0E
	140	125		104.0	45.0	6.29	KXM14VE0G
160	160	75	114.0	87.0	65.0	6.50	KXM16VE0C
	160	90		92.5	60.0	7.00	KXM16VE0D
	160	110		99.0	55.0	7.40	KXM16VE0E
	160	125		104.0	50.0	7.80	KXM16VE0G
	160	140		108.0	50.0	7.43	KXM16VE0H



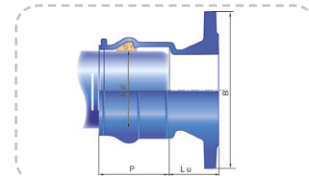
Flanged spigot

DN/OD mm	ØOD mm	Flange DN mm	PN bar	Lu mm	L mm	B mm	Weight kg	Reference
75	75	60	10-16	98	158	175	3.85	KXL75BU1C
75	75	65		98	158	185	4.15	KXL75BU1D
90	90	80		102	167	200	4.70	KXL90BU1E
110	110	100		110	180	220	6.00	KXM11BU1F
125	125	125		114	188	250	7.90	KXM12BU1G
140	140	125		119	190	250	8.56	KXM14BU1G
160	160	150		127	197	285	12.10	KXM16BU1J



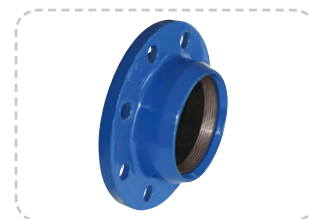
Flanged socket

DN/OD mm	ØOD mm	Flange DN mm	PN bar	P mm	Lu mm	B mm	Weight kg	Reference
75	75	60	10-16	87.0	58	175	5.00	KXL75BE1C
75	75	65		87.0	58	185	5.30	KXL75BE1D
90	90	80		92.5	68	200	5.50	KXL90BE1E
110	110	100		99.0	68	220	6.70	KXM11BE1F
125	125	125		104.0	66	250	8.20	KXM12BE1G
140	140	125		108.0	62	250	9.15	KXM14BE1G
160	160	150		114.0	68	285	11.00	KXM16BE1J



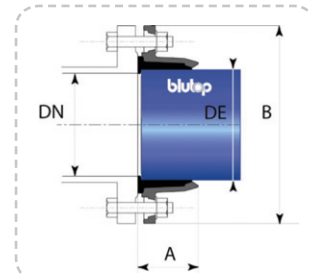
Anchored flange adapter

DN/OD mm	DN mm	A	B	Weight kg	Reference
75	60-65	58	185	2.50	226300
90	80	62	200	2.80	216901
110	100	68	220	3.40	216902
125	125	73	250	4.30	216906
140	125	76	250	5.00	233658
160	150	82	285	5.70	226301



Unanchored flange adapter

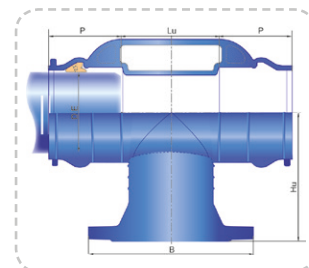
DN/OD mm	DN mm	A	B	Weight kg	Reference
75	60-65	58	185	2.30	MAL75DACH
90	80	62	200	2.60	MAL90DACH
110	100	68	220	3.10	160754
125	125	73	250	4.10	160755
140	125	76	250	4.10	160756
160	150	82	285	5.20	160757



The blutop range

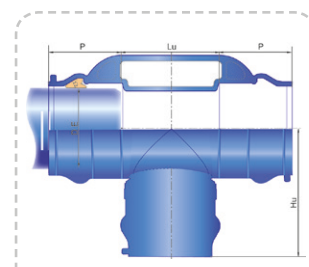
Flanged tee with two sockets

DN/OD mm	ØOD mm	Flange DN	PN bar	P mm	Lu m	Hu mm	B mm	Weight kg	Reference
75	75x40	40	10-16	87.0	60.0	130.0	150.0	5.80	KXL75TD1A
	75x60	60			85.0	140.0	175.0	7.80	KXL75TD1C
	75x65	65			85.0	140.0	185.0	8.20	KXL75TD1D
90	90x40	40	10-16	92.5	65.0	135.0	150.0	6.80	KXL90TD1A
	90x60	60			90.0	155.0	175.0	8.60	KXL90TD1C
	90x65	65			90.0	160.0	185.0	8.70	KXL90TD1D
	90x80	80			105.0	160.0	200.0	9.40	KXL90TD1E
110	110x40	40	10-16	99.0	65.0	145.0	150.0	7.60	KXM11TD1A
	110x60	60			90.0	165.0	175.0	9.40	KXM11TD1C
	110x65	65			90.0	160.0	185.0	9.50	KXM11TD1D
	110x80	80			105.0	170.0	220.0	11.00	KXM11TD1E
125	125x40	40	10-16	104.0	65.0	160.0	150.0	9.20	KXM12TD1A
	125x60	60			90.0	160.0	175.0	10.80	KXM12TD1C
	125x65	65			90.0	160.0	185.0	11.10	KXM12TD1D
	125x80	80			105.0	170.0	200.0	11.50	KXM12TD1E
	125x100	100			125.0	180.0	220.0	12.20	KXM12TD1F
	125x125	125			150.0	180.0	250.0	15.00	KXM12TD1G
140	140x40	40	10-16	108.0	65.0	160.0	150.0	9.34	KXM14TD1A
	140x60	60			90.0	180.0	175.0	11.04	KXM14TD1C
	140x65	65			90.0	180.0	185.0	11.20	KXM14TD1D
	140x80	80			105.0	185.0	200.0	12.35	KXM14TD1E
	140x100	100			125.0	195.0	220.0	14.03	KXM14TD1F
	140x125	125			150.0	200.0	250.0	16.28	KXM14TD1G
160	160x40	40	10-16	114.0	65.0	170.0	150.0	11.30	KXM16TD1A
	160x60	60			90.0	190.0	175.0	12.90	KXM16TD1C
	160x65	65			90.0	190.0	185.0	12.90	KXM16TD1D
	160x80	80			105.0	200.0	200.0	14.30	KXM16TD1E
	160x100	100			125.0	205.0	220.0	16.40	KXM16TD1F
	160x125	125			150.0	210.0	250.0	18.00	KXM16TD1G
	160x150	150			175.0	220.0	285.0	20.30	KXM16TD1J



Tee with three sockets

DN/OD mm	ØOD mm	P mm	p mm	Lu m	Hu mm	Weight kg	Reference
75	75x75	87.0	87.0	85.0	52.0	5.60	KXL75TE0C
90	90x75	92.5	87.0	90.0	60.0	6.30	KXL90TE0C
	90x90	92.5	92.5	105.0	56.0	6.80	KXL90TE0D
110	110x75	99.0	87.0	90.0	70.0	8.00	KXM11TE0C
	110x90		92.5	105.0	67.0	7.80	KXM11TE0D
	110x110		99.0	134.0	74.0	8.70	KXM11TE0E
125	125x75	104.0	87.0	90.0	75.0	8.80	KXM12TE0C
	125x90		92.5	105.0	74.0	9.20	KXM12TE0D
	125x110		99.0	125.0	74.0	10.00	KXM12TE0E
	125x125		104.0	150.0	74.0	11.00	KXM12TE0G
140	140x110	108.0	99.0	125.0	82.0	10.55	KXM14TE0E
	140x125		104.0	150.0	82.0	11.46	KXM14TE0G
	140x140		108.0	155.0	82.0	11.90	KXM14TE0H
160	160x110	114.0	99.0	125.0	92.0	13.00	KXM16TE0E
	160x125		104.0	140.0	92.0	13.60	KXM16TE0G
	160x140		108.0	150.0	92.0	13.25	KXM16TE0H
	160x160		114.0	175.0	92.0	15.10	KXM16TE0J



Cap

DN/OD mm	ØOD mm	Lu mm	Reference	Weight kg
75	75	101.0	KXL75BH	1.60
90	90	107.0	KXL90BH	2.00
110	110	113.0	KXM11BH	2.20
125	125	118.0	KXM12BH	2.95
140	140	122.0	KXM14BH	3.00
160	160	128.0	KXM16BH	4.30



VALVES

Euro 20® valve - PFA 16 bar

DN/OD	Anticlockwise-to-close, bonnet		Clockwise-to-close, bare screw	
	Reference	Weight kg	Reference	Weight kg
75	RDL75KDXH	12.3	RDL75KBXH	12.1
90	RDL90KDXH	12.8	RDL90KBXH	12.6
110	RDM11KDXH	16.2	RDM11KBXH	16.0
125	RDM12KDXH	22.8	RDM12KBXH	22.6
140	RDM14KDXH	24.8	RDM14KBXH	25.0
160	RDM16KDXH	30.0	RDM16KBXH	29.8



Connection with BLUTOP® pipe - BLUTOP® anchored joint

DN/OD	Weight kg	Reference
75	0.067	JXL75CA
90	0.076	JXL90CA
110	0.093	JXM11CA
125	0.118	JXM12CA
140	0.190	JXM14CA
160	0.221	JXM16CA



Connection with PVC-U, PVC-BO and PE - Anchored IZIFIT® joint 16 bar

DN/OD	Weight kg	Reference
75	0.109	JIL75CA
90	0.125	JIL90CA
110	0.146	JIM11CA
125	0.189	JIM12CA
140*	2.800	JZM14VX + JXM14BA
160*	3.100	JZM16VX + JXM16BA

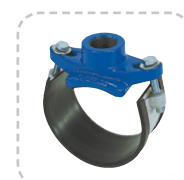
*DN 140 and 160 : locking extension piece



CONNECTIONS

MPE multimaterial collars / PFA 16 bar

For main pipes		Small bulge M 40 x 3		Large bulge M 55 x 3	
Nominal DN	Min-max. OD	Reference	Weight	Reference	Weight
75	75 - 83	RSL75CPAB	1.80	-	-
90	88 - 100	RSL90CPAB	2.00	RSL90CQAB	2.20
110	110 - 122	RSM11CPAB	2.40	RSM11CQAB	2.30
125	125 - 137	RSM12CPAB	2.40	RSM12CQAB	2.30
140	139 - 150	RSM14CPAB	2.60	RSM14CQAB	2.70
160	160-172	RSM16CPAB	2.70	RSM16CQAB	2.80



CONNECTIONS

Collars for PVC and PE pipes and BLUTOP® pipes / PFA 16 bar

For main pipes DN	Small bulge M 40 x 3		Large bulge M 55 x 3	
	Reference	Weight kg	Reference	Weight kg
75	173886	2.40	202176	2.50
90	173887	2.90	178312	2.90
110	173888	3.10	178313	3.30
125	178297	3.45	178314	3.45
140	173889	3.50	178315	3.60
160	202177	3.70	202178	3.80



TOOLS

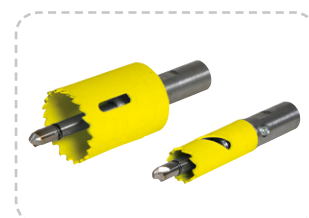
bludril for tapping BLUTOP® pipes

Reference	Weight kg
228099	6.00



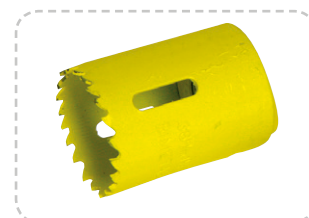
Complete tapping tool for BLUTOP® pipes

Diameter	Reference	Weight kg
19	214191	0.19
24	214193	0.20
30	214195	0.26
38	214196	0.27



Multi-tooth core cutting attachment only (for tapping BLUTOP®) pipes

Diameter	Reference	Weight kg
19	215444	0.10
24	215445	0.12
30	215446	0.17
38	215447	0.24

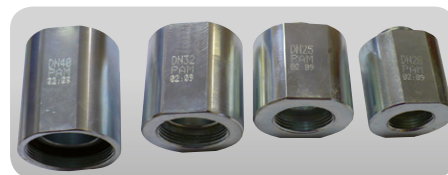


TOOLS

BLUTOP® PIPE TAPPING ACCESSORIES

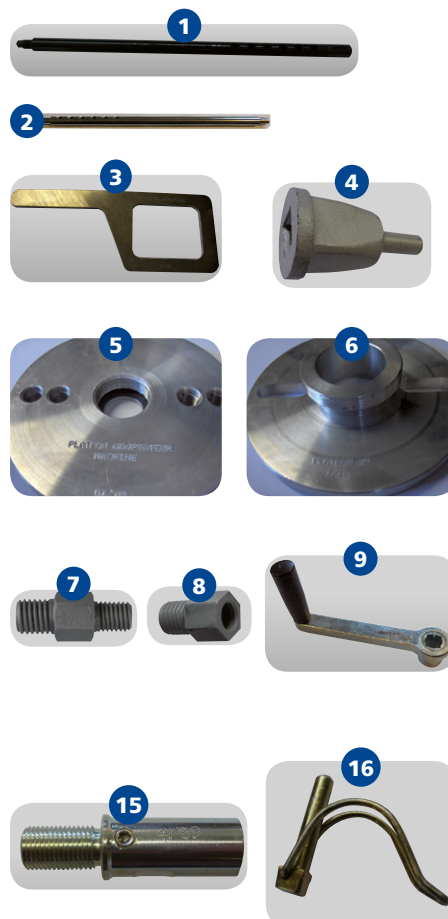
BLUTOP® tapping adapters for EIE machines

Description	Weight in kg	Reference
EIE/PAM machine adapter DN 20	0.98	220947
EIE/PAM machine adapter DN 25	1.32	220948
EIE/PAM machine adapter DN 32	1.20	220949
EIE/PAM machine adapter DN 40	1.34	220950



Tools and accessories for EIE/PAM tapping machines

Désignation	Weight in kg	Reference
1 EIE/PAM origin rod (D17 M14 L 402 mm)	0.68	220956
2 TOP rod M14 L 402 for electric screwdrivers	0.65	220899
3 CR66 kit disassembly wrench	0.38	220898
4 14 mm socket for electric screwdrivers	0.34	220951
5 1" flange female adapter disk	0.72	220900
6 2" flange male adapter disk	0.43	220922
7 M14-M12 male/male nipple	0.05	220911
8 M14-M12 male/female taper	0.02	221662
9 Windlass handle	0.45	220921
10 Electric screwdriver extension shaft D12/M14 L 150 mm	0.14	220923
11 Electric screwdriver extension shaft D12/M14 L 45 mm	0.04	220931
12 Bosch 14.4 V electric screwdriver	5.30	220979
13 Drill-bit locking screw	0.02	220952
14 Centring drill-bit DN 8	0.04	220954
15 Bare core-cutting attachment 20 25 32 (40 excluded)	0.05	220955
16 8x28 cotter pin (spline)	0.02	220953



ADAPTER KIT FOR OTHER TAPPING MACHINES

Description	Weight in kg	Reference
17 HUOT adapter kit / DN 20. 25. 32 and 40	2.70	220932
18 Saint-Germain and Staub + PAM adapter kit / DN 20.25. 32	1.47	220933
19 Pamco adapter kit / DN 20. 25. 40	1.62	220934
20 Iseo/Bayard adapter kit / DN 20. 25. 32. 40	2.11	220935
21 AVK adapter kit / DN 20. 25. 32 and 40	2.13	220946
22 HAWLE M/M adapter kit	2.70	225113
23 Adapter kit for VHM machines (2"F)	2.60	228109

The blutop range

INSTALLATION

Blutrak laying trolley for narrow trenches

Description	Weight in kg	Reference
Mother and daughter trolleys + accessories	201	237026
Box	55	NC

blutrak



EXACT cutting machine

Pipe Cutting System 230 V — 50-60 Hz	Weight in kg	Reference	Range of use DE iron pipe mm	Max pipe wall	Blade diameter
EXACT 170E	5.7	239649	15-170	8	X140



Recommended by Saint-Gobain PAM

- Lightweight, safe, self-guided
- Clean cut and fast cutting
- Perfectly straight
- Power supply

ACCESSORIES

BLUTOP® pipe repair product

Description	Weight in kg	Reference
Can of Aquacoat® BLUTOP	0.75	240992



BLUTOP® lubricating paste

Description	Weight in kg	Reference
BLUTOP® lubricating paste	0.850	214611



Pack of 10 BLUTOP® flexible sleeves

DN/OD	Reference
75	224053
90	223164
110	223163
125	223165
140	—
160	228021



MECHANICAL SPECIFICATIONS OF PIPES AND FITTINGS

The metallurgical properties of BLUTOP® pipes and fittings are as specified in the EN 545 standard

Property	Unit	Pipes	Fittings
Minimum tensile strength, S _m	MPa	420	420
Minimum rupture strain, A	%	10	5
Maximum Brinell hardness	HB	230	250
Minimum Young's modulus	GPa	170	170

PIPE SPECIFICATIONS

According "Avis Technique CSTB".

DN/OD	75		90		110		125		140		160	
Outside diameter and tolerances (mm)	75	+0.5 - 1.0	90	+0.6 - 1.2	110	+0.7 - 1.0	125	+0.8 - 1.0	140	+0.9 - 1.0	160	+1.0 - 1.0
Mean internal diameter (mm)	68		83		103		118		132		152	
Nominal iron thickness (mm)	3.0		3.0		3.0		3.1		3.1		3.1	
Design thickness (mm) (1)	2.2		2.2		2.2		2.3		2.3		2.3	
Nominal density (kg/m) (2)	5.1		6.1		7.6		8.9		10		11.5	
Nominal mean hydraulic cross-section (mm ²)	3,632		5,411		8,332		10,936		13,685		18,146	

(1) The pipe wall must not be thinner than the design thickness at any point

(2) Guide iron weight, assuming a mean wall thickness of 3.0 mm

TECHNICAL SPECIFICATIONS OF THE DUCTAN® LINING

The table below shows the main properties of DUCTAN®.

Property	Value
Colour	Ultramarine blue (similar to RAL 5002)
Density (dry film)	0.96 g/cm ³
Adherence (ISO 4624)	≥ 10 MPa on shot-blasted steel plate
Shore D hardness	44
Rupture strain (ISO 527)	≥ 400%
Stress cracking (ASTM D1693)	> 1,000h
Induction time before oxidation at 200°C (EN 728) of DUCTAN® powder	> 10 min in oxygen

Technical specifications

The table below shows the main performance parameters for the DUCTAN® lining applied to the interior of BLUTOP® pipe cylinders.

Property	Criterion
Adherence	• 15 MPa mean value (8 MPa minimum value)
Non-porosity (holiday detector inspection)	• Holiday-free inner surface lining when measured at a voltage of 1,500 V
Reverse impact strength (opposite surface)	• No holiday detector jolts when subjected to a 10 J impact
Smoothness coefficient	< 0.01mm

The table below shows the main in-water ageing performance parameters for the DUCTAN® lining applied to the interior of BLUTOP® pipe cylinders.

Durability – Resistance to thermal ageing in water	Criterion in scratch	Criterion away from scratch
<p>The durability of the DUCTAN® interior corrosion protection is measured following an immersion test in water at a temperature of 50°C, conducted in accordance with EN ISO 2812-2-1995. The exposure time is 480 h.</p> <p>An inverted V (starting from the acute angle) measuring 1 mm in width and at least 50 mm in length is etched into each test specimen.</p> <p>Two areas are assessed</p>	• Maximum blister width on each side of the scratch: <5 mm	Blistering: ID<2 mm and OD<2 mm as per EN ISO 4628-2
	• Maximum corrosion propagation width on each side of the scratch: <5 mm	Corrosion < Ri1 as per EN ISO 4628-3
	–	Mean adherence evaluated by tensile testing in accordance with EN ISO 4624-2003: Requirement ≥ 6 MPa.

TECHNICAL SPECIFICATIONS OF THE BIOZINALIUM® COATING

The BioZinalium® coating consists of two layers:

- A layer of zinc-aluminium 85/15 alloy, enriched with copper, with a minimum surface density of 400g/m², applied by spraying molten metal onto the surface of the iron, using an electric arc spray gun, from ZnAl (Cu) alloy wire.
- A protective layer of Aquacoat® (semi-permeable), a water-based blue acrylic of average thickness 80 microns applied using a spray gun.

TECHNICAL SPECIFICATIONS OF THE EPOXY COATING ON FITTINGS

This performance complies with the requirements of the standard EN 14901.

Performance tests	Criterion
Non-porosity	Holiday free detector jolts at 1,500 V
Impact resistance	Holiday free detector jolts at 1,500 V when the specimen is subjected to a 5 J impact
Durability – Resistance to thermal ageing in water	After applying the test procedure, the coating must have a mean adherence of at least 6 MPa.
Indentation resistance	The indentation depth measured after 48 h must not exceed 30% of the original measured coating thickness. Any increase in indentation depth measured between 24 h and 48 h must be less than that measured between 0 and 24 h and must not exceed 5% of the original measured coating thickness.
Durability – Resistance to thermal ageing in air	The coating must remain non-porous after applying the test procedure

APPLICATION SCOPE DEPENDING ON SOIL CONDITIONS

The pipes and fittings in the BLUTOP® range are suitable for burying in most types of ground, as defined in the EN 545:2010 standard, Annex D.2.2 "Scope of Application", with the following exceptions:

- acidic peaty ground;
- ground containing waste, ash or slag, or polluted by solid or liquid industrial waste;
- ground below the marine water table with a resistivity of less than 500 Ω cm.

We recommend the PAM Standard TT product range for applications in the above types of ground, and also where stray currents may be encountered.

APPLICATION SCOPE DEPENDING ON WATER CONDITIONS

The products in the BLUTOP® range are suitable for use with all types of potable water in accordance with the European Directive 98/83/EC.

Water properties	Unit	BLUTOP® range
Minimum pH value	-	4
Maximum pH value	-	10
Minimum hardness	°	Not limited
Maximum aggressive CO2 content mg/l	mg/l	Not limited
Maximum sulphate content	mg/l	Not limited
Maximum magnesium content	mg/l	Not limited
Maximum ammonia content	mg/l	Not limited

MAXIMUM COVER DEPTHS FOR BLUTOP® PIPES

Cover depths vary according to the site conditions

Case	Lit de pose	Enrobage	Compaction	Es	Min. 2 alpha
Case 1	Levelled trench floor	Group 4, 3, 2 or 1	Uncompacted	< 0.3 MPa	30°
Case 2	Selected materials	Group 3, 2 or 1	Compacted and inspected	1.0 MPa	60°
Case 3	Selected materials	Groupe 2 or 1	Compacted and inspected q5	1.2 MPa	90°
Case 4	Selected materials	Groupe 1	Compacted and inspected q4	2.0 MPa	90°

Maximum cover depths for BLUTOP® pipes not subjected to rolling loads

Unit	Case 1 m	Case 2 m	Case 3 m	Case 4 m
75	32.9	44.8	50.0	50.0
90	22.8	31.5	37.2	38.7
110	17.1	24.1	28.6	30.5
125	12.3	18.0	21.5	23.8
160	9.1	14.1	17.0	19.9

Maximum cover depths for BLUTOP® pipes subjected to rolling loads

DN/OD	Case 1 m	Case 2 m	Case 3 m	Case 4 m
75	32.9	44.8	50.0	50.0
90	22.8	31.5	37.2	38.7
110	17.0	24.1	28.6	30.4
125	12.2	18.0	21.5	23.8
160	9.0	14.0	17.0	19.8

In addition, although the minimum depth for laying pipes is 0.3 m, due consideration should be given to potential freezing risks.

Technical specifications

QUALITY, STANDARDS AND ACCREDITATION

Quality management

The Saint-Gobain PAM quality management system complies with the ISO 9001 standard and covers the design, manufacture and sale of the BLUTOP® range. Compliance with this quality management system is certified by an independent organisation..

Environmental management

The plants that manufacture the pipes and fittings in the BLUTOP® range are ISO 14001-certified.

European standards

The following European standards apply to the BLUTOP® range::




- EN 805 – Overall design of the BLUTOP® range
- EN 681.1 – Joint gasket
- EN 12842 – Fittings in the BLUTOP® range
- EN 14901 – Epoxy coating on BLUTOP® fittings and accessories

In addition, the requirements of the standard EN 545 apply to the BLUTOP® range, except for:

- Standard DN/OD diameters (in accordance with EN 805-2000)
- Standard pressure class: C25 (MAWP: 25 bar)
- Thermoplastic lining

The performance tests to establish the characteristics of the products in the BLUTOP® range are conducted in accordance with the standard EN 545.

The relevant documents are available to view on our website: www.blutop.fr.

 ATTESTATION DE PERFORMANCE DES ASSEMBLAGES Centre Emetteur : METZ CB188/09/1961786/2.C.TG n°1a					
BUREAU VERITAS certifie avoir examiné la documentation technique de SAINT-GOBAIN PAM n° E0409 FG2923 / E0409 FG2908 de l'assemblage flexible à embouture et bout uni de type BLUTOP et atteste que les essais de performance ont été effectués selon la norme EN 545 : 2006 et ont donné les résultats suivants :					
Assemblage	Essai	Pression d'essai	Durée	Conditions	Resultats
BLUTOP DN 90 DN 110 DN 125 PFA 25 bar	Essai à pression interne positive selon EN 545 essai 15 § 5.2 et 7.2	42,5 bar	2 h	- Effort tranchant - Déviation - Jeu annulaire maximum - Epaisseur minimale	Conforme
	Essai à pression interne négative selon EN 545 essai 25 § 5.2 et 7.3	- 0,9 bar	2 h	- Effort tranchant - Déviation - Jeu annulaire maximum - Epaisseur minimale	Conforme
	Essai à pression externe positive selon EN 545 essai 3 § 5.2 et 7.4	2 bar	2 h	- Effort tranchant - Jeu annulaire maximum - Epaisseur minimale	Conforme
	Essai à pression interne cyclique selon EN 545 essai 49 § 5.2 et 7.6	25 bar	24000 Cycles	- Effort tranchant - Jeu annulaire maximum - Epaisseur minimale	Conforme
Nota : l'essai de performance en DN 90 et DN 110 est représentatif de la gamme Blutop de SAINT-GOBAIN PAM en DN 90-125 selon NF EN 12842 : 2000 § 5.1					
METZ, le 21 septembre 2009 Expert: T. GARCIA  					

SAINT-GOBAIN PAM worldwide

ALGERIA

SAINT-GOBAIN PAM ALGERIE

Z.I. Sidi Abdelkader-Ben Boulaid - BP 538
09000 - BLIDA - Algeria
Phone: + 213 (0) 25 36 00 60

ARGENTINA

SAINT-GOBAIN PAM ARGENTINA

Bouchard y Enz
1836 - LLAVALLOL - BUENOS AIRES - Argentina
Phone: + 54 11 42 98 9600

AUSTRALIA

SAINT-GOBAIN PAM

15 Edgars Road
THOMASTOWN VIC 3074 - Australia
Phone: + 61 (0) 3 9358 6122

AUSTRIA

SAINT-GOBAIN GUSSROHRVERTRIEB ÖSTERREICH GmbH

Archenweg, 52
A-6020 - INNSBRUCK - Austria
Phone: + 43 512 341 717-0

BELGIUM

SAINT-GOBAIN PIPE SYSTEMS

Raathovenstraat, n°2
B-3400 - LANDEN - Belgium
Phone: + 32 11 88 01 20

BRAZIL

SAINT-GOBAIN CANALIZACAO LTDA

Praia de Botafogo 440 7° andar
22250-040 - RIO DE JANEIRO - RJ - Brazil
Phone: + 55 21 2128 1677

CHILE

SAINT-GOBAIN PAM CHILE

Antillanca Norte 600
Parque Industrial Vespucio, Comuna de Pudahuel
SANTIAGO DE CHILE - Chile
Phone: + 562 444 13 00

CHINA

SAINT-GOBAIN PAM CHINA (SHANGAI)

7th Floor, Office Tower
Bund Center - 222 Yan'an Road (East)
200002 - SHANGAI - China
Phone: + 86 21 6361 2142

SAINT-GOBAIN PAM CHINA (XUZHOU)

Dong Jiao Yangzhuang
PC 221004 - XUZHOU - Jiangsu Province - China
Phone: + 86 516 8787 8107

SAINT-GOBAIN PAM CHINA (MAANSHAN)

Hua Gong Road Cihu
PC 243052 - MAANSHAN Anhui Province - China
Phone: + 86 555 350 8040

COLOMBIA

SAINT-GOBAIN PAM COLOMBIA

Terminal terrestre de carga de Bogota
Etap 1, Bodega 9, Modulo 3
Km 3,5 costado sur autopista - Medellin
COTA CUNDINAMARCA - Colombia
Phone: + 57 (1) 841 5832

CZECH REPUBLIC

SAINT-GOBAIN PAM CZ s.r.o.

Počernická 272/96
108 03 Praha 10 - Czech Republic
Phone: + 296 411 746

FINLAND

SAINT-GOBAIN PIPE SYSTEMS OY

Nuijamiestentie 3A
FIN-00400 - HELSINKI - Finland
Phone: + 358 207 424 600

FRANCE & DOM-TOM

SAINT-GOBAIN PAM (HEAD OFFICE)

21, avenue Camille Cavallier
54705 PONT-A-MOUSSON CEDEX - France
Phone: +33 3 83 80 73 50

SAINT-GOBAIN PAM

(France Commercial Department)
CRD - Chemin de Blénod - B.P. 109
54704 PONT A MOUSSON CEDEX - France
Phone: +33 3 83 80 73 00

SAINT-GOBAIN PAM

(Europe and International Commercial Departments)
21 avenue Camille Cavallier
54705 - PONT A MOUSSON CEDEX - France
Phone: + 33 3 83 80 67 89

SAINT-GOBAIN PAM

(Local Agency of The Antilles)
Rue Alfred Lumière - ZI de Jarry - BP 2104
97122 - BAIE MAHAULT - Guadeloupe
Phone: + 33 590 26 71 46

GERMANY

SAINT-GOBAIN PAM DEUTSCHLAND

Saarbrucker Strasse 51
66130 - SAARBRUCKEN - Germany
Phone: + 49 681 87 010

GREECE

SAINT-GOBAIN SOLINOUGEIA

5 Klissouras Str.
GR 14482 - METAMORFOSI - ATHENS - Greece
Phone: + 30 210 28 31 804

HONG KONG

SAINT-GOBAIN PIPELINES

H15/F Hermes Commercial Centre - 4-4A Hillwood Road
TSIM SHA TSUI - KOWLOON - Hong Kong
Phone: + 852 27 35 78 26

INDIA

SAINT-GOBAIN PAM

Grindwell Norton Ltd
5th Level, Leela Business Park - Andheri-Kurla Road
MUMBAI - 400059 - India
Phone: + 91 22 402 12 121

ITALY

SAINT-GOBAIN PAM ITALIA SPA

Via Romagnoli n°6
I-20146 - MILAN - Italy
Phone: + 39 02 42 431

JORDAN

SAINT-GOBAIN PAM REGIONAL OFFICE

Abu Zaid Center - Office # 8
35 Saad Bin Abi Waqqas St. - PO BOX 831000
11183 AMMAN - Jordan
Phone: + 962 6 551 4438

KENYA

SAINT-GOBAIN DEVELOPMENT EAST AFRICA LTD

83, Muthithi Road
P.O. Box 17915-00500
Westland Nairobi - Kenya
Phone: + 254 7 31 02 12 35

MOROCCO

SAINT-GOBAIN MAROC DEVELOPMENT

2 allée des Figuiers - Ain Sebaâ
CASABLANCA - Morocco
Phone: + 212 522 66 57 31

MEXICO

SAINT-GOBAIN PAM MEXICO

HORACIO 1855-502 - Colonia Los Morales - Polanco
11510 - MEXICO D.F. - Mexico
Phone: + 52 55 5279 1657

NETHERLANDS

SAINT-GOBAIN PIPE SYSTEMS

Markerkant 10-17
1316 - AB ALMERE - Nederland
Phone: + 31 36 53 333 44

NORWAY

SAINT-GOBAIN PAM NORWAY

Brobekkveien 84
N-0614 OSLO - Norway
Phone: + 47 23 17 58 60

PERU

SAINT-GOBAIN PAM PERU

Avenida de los Faisanes N° 157 - Chorillos
LIMA 09 - Peru
Phone: + 511 252 40 34/35

POLAND

SAINT-GOBAIN CONSTRUCTION PRODUCTS POLSKA

SP Z.O.O - PAM Business Unit

Ul. Cybertyki 21
PL-02-677 WARSZAWA - Poland
Phone: + 48 22 751 41 72

PORTUGAL

SAINT-GOBAIN PAM PORTUGAL

Est. Nac. 10 - Lugar de D. Pedro -Apartado 1708
P-2690-901 - SANTA IRIA DE AZOIA - Portugal
Phone: + 351 218 925 000

ROMANIA

SAINT-GOBAIN CONSTRUCTION PRODUCTS

ROMANIA S.R.L. - PAM Business Unit

Str. Tipografilor nr. 11-15
S-Park/Corp - B3 B4 - Sector 1 - Cod 013714
BUCHAREST - Romania
Phone: + 40 21 207 57 37

SLOVAKIA

SAINT-GOBAIN CONSTRUCTION PRODUCTS

PAM Business Unit

Stará Vajnorska 139
83102 - BRATISLAVA - Slovakia
Phone: + 421 265 45 69 61

SOUTH AFRICA

SAINT-GOBAIN CONSTRUCTION PRODUCTS

PAM Business Unit

N1 Business Park
Corner Olievenhoutbosch Road & Old Johannesburg Road
Samrand - PO BOX 700
GERMISTON - South Africa 1400
Phone: +27 12 657 2800

SPAIN

SAINT-GOBAIN PAM ESPANA

C/Príncipe de Vergara, 132 planta 7
28002 - Madrid - Spain
Phone: + 34 91 397 20 00

UNITED ARAB EMIRATES

SAINT-GOBAIN PAM GULF

Jebel Ali Free Zone, Plot S10817
POBOX 261484
Dubai - United Arab Emirates
Phone: + 971 4 8011 800

UNITED KINGDOM

SAINT-GOBAIN PAM UK

Lows Lane - Stanton-by-Dale
ILLKESTON - DERBYSHIRE - DE7 4QU
United Kingdom
Phone: + 44 115 930 5000

VIETNAM

SAINT-GOBAIN PAM VIETNAM

IPC TOWER / LEVEL9
1489 Nguyen Van Linh Street
District 7
HO CHI MINH CITY - Vietnam
Phone: +84 8 39 30 72 73

www.pamline.com
www.pamline.fr

SAINT-GOBAIN PAM

Head office

21, avenue Camille Cavallier
54705 PONT-A-MOUSSON CEDEX
FRANCE
Phone : +33 (0) 3 83 80 73 50
Fax : +33 (0) 3 83 80 76 60

Water - Sewage - Municipal Castings Marketing

21, avenue Camille Cavallier
54705 PONT-A-MOUSSON CEDEX
FRANCE
Phone: +33 (0)3 83 80 67 89

